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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,734	02/23/2004	Suresh Subramanian	121499 (07783-0163)	2450

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EXAMINER

FLETCHER III, WILLIAM P

ART UNIT	PAPER NUMBER
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1762

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-19 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment and remarks filed 10/23/2006 are noted.
2. Claims 13-19 remain pending.

Response to Arguments

3. Applicant's arguments, see the remarks, filed 10/23/2006, with respect to the objections and rejections under 35 USC 112, set-forth in the prior Office action, have been fully considered in light of applicant's amendment and are persuasive. These objections and rejections have been withdrawn.

4. Applicant's arguments filed 10/23/2006, with respect to the prior art rejections set-forth in the prior Office action, have been fully considered but they are not persuasive.

A. Applicant argues that Luthra teaches away from turbine blade components. The examiner acknowledges the passage of Luthra cited by applicant, but it is the examiner's position that this section only serves as specific motivation to increase the strength of the component according to the secondary reference(s). Consequently, this argument is not persuasive.

B. Applicant argues that Park is limited to polymeric matrix composites and not ceramic matrix composites. The examiner acknowledges this, but the test of obviousness is not that the references be physically combinable, but what the references taken as a whole would have suggested to one of ordinary skill. In the instant case, the teaching of Park with respect to the warp and weft tows is

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equally applicable where said tows are impregnated with a polymer or a ceramic. Consequently, this argument is not persuasive. This applies also to applicant's argument bridging pages 11-12 of the remarks.

C. Similarly, with respect to the Handbook reference, the test of obviousness is not that the references be physically combinable, but what the references taken as a whole would have suggested to one of ordinary skill. In the instant case, the teaching of Handbook with respect to orientation of the plies is equally applicable where said tows are impregnated with a polymer or a ceramic. Consequently, this argument is not persuasive.

D. With respect to Corman, this reference teaches that the claimed compounds are art-recognized as suitable for achieving the claimed purpose. See MPEP 2144.07. Consequently, this argument is not persuasive.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luthra et al. (*Melt Infiltrated (MI) SiC/SiC Composites for Gas Turbine Applications*, GE Research & Development Center, 2001CRD112) in view of Park (US 3,925,587 A), Corman et al. (US 5,952,100 A), and *Handbook of Composites*, 2nd Edition.

A. With respect to independent claim 13, Luthra teaches the laying-up, CVI rigidizing, partial, and further densification steps recited in this claim as broadly and conventionally known in the art (pp. 3-4).

This reference fails to teach: (i) the particular orientation of the plies and the fashion in which they are laid-up; (ii) that CVI includes infiltration of BN and SiC; and (iii) that the component is an aircraft engine component.

i. Insofar as Luthra teaches that a "woven" cloth, it is the examiner's position that the cloth has at least a first warp direction and a second weft direction. Park discloses a woven fabric suitable for use in the formation of a carbon composite having a fewer number of weft tows than warp tows, which imparts tensile strength to the fabric in the longitudinal direction (5:19-64). Consequently, it would have been obvious to one of ordinary skill in the art to modify the process of Luthra so as to utilize such a fabric motivated by the desire to impart said longitudinal tensile strength to the finished composite. Further, *Handbook* teaches that it is known in the art of ceramic

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composites to arrange/orient plies in the composite so as to achieve a desired, among other things, elastic strength (page 321, for example). Consequently, it would have been obvious to one of ordinary skill in the art to modify the process of Luthra so as to orient the biased plies so as to give a desired tensile strength in a desired direction.

ii. Corman teaches that it is common in CVI of SiC-SiC composites to infiltrate with both BN and SiC (6:39-47). Consequently, it would have been obvious to one of ordinary skill in the art to modify the process of Luthra, which is silent as to CVI materials, so as to infiltrate with both BN and Sic, which is known in the art as suitable for this purpose.

iii. Finally, none of the cited references teaches that the turbine engine component is an aircraft turbine engine component. Nevertheless, it is the examiner's position that the high-temperature turbine engine components of Luthra are either inherently suitable for such a purpose or, with suitable modifications to manufacturing techniques well within the purview of one of ordinary skill, it would have been obvious to utilize this process to manufacture aircraft turbine engine components.

B. With respect to claim 14, Park teaches a warp to weft ratio "significantly greater than 1:1" (5:19-23).

C. With respect to claim 15, Luthra teaches SiC-containing plies (page 2, bottom).

D. With respect to claims 16-18, although none of the cited references specifies these particular components, it is the examiner's position that the process of

the cited art is sufficiently robust as to render the manufacture of these other components obvious as well.

8. **Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luthra et al. (*Melt Infiltrated (MI) SiC/SiC Composites for Gas Turbine Applications*, GE Research & Development Center, 2001CRD112) in view of *Handbook of Composites, 2nd Edition*.**

A. These claims are rejected over these references for the same reasons as detailed above. Specifically, as noted above, orientation of plies to give a desired tensile strength would have been obvious.

B. Further, although none of the cited references specifies these particular components, it is the examiner's position that the process of the cited art is sufficiently robust as to render the manufacture of these other components obvious as well.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

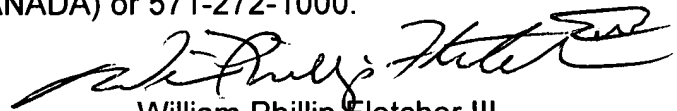
10. The prompt development of clear issues in the prosecution history requires that applicant's reply to this Office action be fully responsive (MPEP § 714.02). When filing an amendment, applicant should specifically point out the support for any amendment made to the disclosure, including new or amended claims (MPEP §§ 714.02 & 2163). A fully responsive reply to this Office action, if it includes new or amended claims, must therefore include an explicit citation (i.e., page number and line number) of that/those portion(s) of the original disclosure which applicant contends support(s) the new or amended limitation(s).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William P. Fletcher III whose telephone number is (571) 272-1419. The examiner can normally be reached on Monday through Friday, 0900h-1700h.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



William Phillip Fletcher III
Primary Examiner
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January 8, 2007